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SYSTEM AND CLAMP FOR SUPPORTING ARTICLES**FIELD OF THE INVENTION**

THIS INVENTION relates to supporting articles for storage and/or display purposes, or the like. In particular, the invention relates to a system and to a clamp for supporting at least one article.

BACKGROUND TO THE INVENTION

A need often arises to support a plurality of articles in a certain way, especially in the retail environment, which displays need to be changed frequently, to adapt to changing circumstances, such as changing products, changing advertisement strategies, or the like. A need often arises for a system that can support an indeterminate number of articles in an indeterminate number of ways, which can be changed with little effort.

SUMMARY OF THE INVENTION

According to a first aspect of the invention there is provided a system for supporting at least one article, said system including:

- a support structure including at least one elongate element;
- at least one clamp defining a recess flanked by two resilient arms and being removably attachable to the elongate element by receiving the elongate

element in the recess in a clipping fashion, and which can be held releasably in position on the elongate element by inwardly resilience of the arms; and
an article support formation, attachable to the clamp.

The word "clamp" is used to indicate a device which is attachable to an article by way of the clamping action of two or more resilient features. Such a device is sometimes also called a "clasp".

The elongate element may have a predetermined cross-sectional profile, such as a cylindrical or square profile, and the clamp may define a part complementary profile on an inner periphery of the recess, such as a part cylindrical profile or a part rectangular profile.

A number of element engagement formations may be provided on the inner periphery of the clamp recess, to engage an elongate element, resiliently.

Each arm of the clamp may include a guide element, defining a generally radially extending guide surface, at the end of the arm, to assist in alignment of the elongate element with an opening defined between the ends of the two arms, when receiving the elongate element in the recess.

The clamp may include a catch, attachable to ends of the two arms, and configured to exert an inward bias on the ends of the arms, to urge

them closer together and thereby assist in holding the elongate element in position within the recess.

The catch may include a main part, pivotally attachable to one arm of the clamp, and a linkage part, pivotally attachable or preferably attached, to the end of the other arm of the clamp. The main part and linkage part may be pivotally connected, so that the catch may operate in an over-centred configuration, in which the main part and linkage part may be oriented at a large angle relative to each other, when the catch is in a free condition, and wherein the main part and linkage part may be oriented at a small angle relative to each other, when the catch is in a gripping condition, with a resilient bias of the main part retaining the catch in the gripping condition.

It is to be understood that, when the main part and the linkage part are oriented at a small angle relative to each other, the distance between the remote ends of these two parts that are not pivotally attached to each other, but are attachable/attached to the ends of the clamp arms, are at their closest together.

A support formation may include at least one article engagement formation, for supporting an article, such as a container defining a recess in which articles are receivable, a platform, a clamp, or the like.

At least one attachment formation may be defined on an outer periphery of the clamp, to which at least one article support formation may be releasably attachable, by receiving the attachment formation in a complementary formation, defined on the article support formation.

Attachment formations in the form of a plurality of generally axially extending ridges may be defined on the outer periphery of the clamp. Each article support formation may define a complementary formation in the form of a recess, in which the ridges are receivable in a sliding fashion. The ridges and the complementary recess may each have a dovetail cross-sectional profile.

The system may include a light fitting, attachable to the clamp and the invention extends to a clamp as described hereinabove.

The invention will now be described, by way of non-limiting example, with reference to the accompanying diagrammatic drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a top plan view of part of a support system in accordance with a first embodiment of the invention;

Figure 2 shows a top plan view of the system of Figure 1, including a clamp in accordance with a second embodiment of the invention;

Figure 3 shows a detailed top plan view of part of the system of Figure 1, with a catch in its gripping condition;

Figures 4A, 4B, 4C and 4D show three-dimensional views of the system of Figure 1;

Figure 5 shows a three-dimensional view the system of Figure 1, including an article support formation in accordance with a third embodiment of the invention;

Figure 6 shows a three-dimensional view the system of Figure 1, including an article support formation in accordance with a fourth embodiment of the invention; and

Figure 7 shows a three-dimensional view of the system of Figure 1, including a light fitting in accordance with a fifth embodiment of the invention.

DETAIL DESCRIPTION OF THE DRAWINGS

Referring to the drawings, a system in accordance with the invention, for supporting at least one article, is generally indicated by reference numeral 10.

Referring to Figures 1, 3 and 4 of the drawings, the system 10 typically includes a support structure comprising a number of elongate elements in the form of cylindrical poles 12 onto which a number of clamps 14 are attachable, with a number of article support formations 16 attachable to each clamp. However, for the purposes of illustration, in each of the drawings, only a short length of a pole 12, one clamp 14 attached to the pole, and one article support formation 16 attached to the clamp, are shown.

The clamp 14 includes a generally u-shaped body 18 defining an internal recess 20, with a part cylindrical internal profile, complementary to the circumference of the pole 12. The body 18 also defines two resilient arms 22, flanking the recess 20. The resilience of the body 18 is such that the pole 12 is removably receivable in the recess 20 in a clipping fashion, and is held in position within the recess by the inwardly resilience of the arms 22.

A number of receiving formations in the form of dovetail-profiled ridges 24 extend in a generally parallel arrangement, in an axial direction on the outer periphery of the body 18.

The clamp includes a catch 26, configured to urge the ends 28 of the arms 22 closer together, to enhance the resilience with which the arms engage the pole 12. The catch 26 includes a linkage part 30, pivotally attached to an end 28A of one arm 22, and pivotally attached to a main part 32 of the catch 26. The main part 32 includes a free end 34 that is releasably attachable to the end 28B of the other arm 22.

The linkage part 30 is shorter than the main part 32, and the catch 26 can be operated in a so-called "over-centre" arrangement. The catch 26 is shown in Figures 1 and 4 of the drawings in a free condition, in which the linkage part 30 and the main part 32 are disposed at a relatively large angle relative to each other. In the free condition, the free end 34 can be released

from a hook formation 36 defined on the end 28B, to allow the pole 12 to pass through a receiving open 38 defined between the ends 28.

The catch 26 can be clipped in over-centre fashion, to a gripping condition shown in Figure 3 of the drawings, by pressing the main part 32 towards the linkage part 30, so that the linkage part pivots into a position in which it abuts the main part on an inside of the main part, and so that the linkage part and main part are oriented at a small angle relative to each other. In the gripping condition, the ends 28 are urged closer together by the catch 26, and the catch is held in the gripping condition, by an inwardly bias exerted by the main part 32, on the hook formation 36 and on the linkage part 30.

The catch 26 includes locking means in the form of a loop formation 70 defined on the linkage part 30, and a recess 72 defined in the main part 32, through which the loop formation can extend. When the catch 26 is in its gripping condition, the loop formation 70 extends through the recess 72 and can receive a shackle of a padlock (not shown) or the like, to prevent withdrawal of the loop formation through the recess 72, and thus prevent movement of the main part 32 from the linkage part 30, so that the catch 26 is locked in its gripping condition, to prevent tampering, theft, or the like.

Instead of using the catch 26, the clamp 14 may be held in position on the pole 12, by merely relying on the resilience of the body 18 and arms 22.

Generally radially extending guide surfaces 74 are defined on the ends 28 of the arms 22, which act as guide elements, to assist in aligning the pole 12 with the opening 38, when the pole is received in the recess 20.

The article support formation 16 is releasably attachable to the clamp 14 by slideable engagement of one of the ridges 24 into a complementary formation in the form of a dovetail-profiled recess 42, defined in an attachment formation 44 of the article support formation. The article support formation 16 includes an arm 46 extending from the attachment formation 44, and includes an article engagement formation 40 in the form of a clamp 48, at the end of the arm, remote from the attachment formation 44. The clamp 48 has a fixed jaw 50, and a pivoting jaw 52, pivotally displaceable relative to the fixed jaw, so that articles can be clinched between the two jaws. The clamp 48 is releasably attached to the arm 46 by way of a further dovetail attachment 54.

In another embodiment of the invention (not shown), the article support formation 16 does not include an arm 46, but the article engagement formation 40 is closely connected to the attachment formation 44, to support an article closer to the clamp 14 and pole 12.

Referring to Figures 2 and 5 to 7 of the drawings, parts of a support system that are identical to corresponding parts in the support system 10 shown in Figures 1, 3 and 4 of the drawings, are indicated by the same

reference numerals, whereas parts that are similar, are indicated by like reference numerals, but are identified with suffixes, corresponding to the relevant embodiment of the invention.

Referring to Figure 2 of the drawings, a support system 10.2 in accordance with a second embodiment of the invention, includes a clamp 14.2, releasably attachable to a pole 12.2 with a triangular cross-sectional profile. The clamp 14.2 includes three spaced, resiliently compressible element engaging formations 56, attached to an inner periphery of the recess 20.2. The element engagement formations 56 are slightly compressed when the clamp 14.2 is attached to the pole 12.2, by over-centred closing of the catch 26.

Referring to Figure 5 of the drawings, an article support formation 16.3 in accordance with a third embodiment of the invention, includes an article engagement formation 40.3 in the form of a platform 58. The platform 58 is attachable to the arm 46 in a dovetail arrangement 54.3, in similar fashion to the clamp 48 shown in Figures 1 to 3 of the drawings.

Referring to Figure 6 of the drawings, an article support formation 16.4 in accordance with a fourth embodiment of the invention, includes an article engagement formation 40.4 in the form of a container 60. The container 60 defines an internal recess 61 in which articles are receivable, and is attachable to the arm 46 in a dovetail arrangement 54.4, in similar fashion to the clamp 48 shown in Figures 1 to 3 of the drawings.

Referring to Figure 7 of the drawings, the system 10.6 includes a light fitting 62 in accordance with a fifth embodiment of the invention. The light fitting 62 includes an attachment formation 44.5, attachable to the clamp 14, a flexible arm 64, a light bulb 66 disposed at a remote end of the arm 64, and a light shield 68 extending in part around the light bulb 66. The light shield 68 allows light from the light bulb 66 to be directed in spot light-fashion, while the flexibility of the arm 46 allows the light bulb and light shield to be manoeuvred, to direct the light to a specific object.

In use, one or more poles 12 are erected in the vicinity where articles are to be supported or displayed. The poles 12 can be erected in any suitable fashion, e.g. by providing a platform (not shown) at the bottom of a pole, fixedly attaching a top and/or bottom of the pole to adjacent structures such as a floor or ceiling, or the like.

A number of clamps 14 are attached to the poles 12, as described hereinabove and a number of article support formations 16 and/or light fittings 62 are attached to the clamps. Articles to be supported are clasped within the jaws 50,52 of the clamp 48, are placed on the platform 58 or inside the recess 61 of the container 60, as the case may be, to suite the requirements for supporting or displaying the articles. The articles can also be illuminated by directing light from the light bulb 66 to particular articles.

It is to be appreciated that a number of article support formations 16 and/or light fittings 62 can be attached to each clamp 14, and a number of clamps can be attached to each pole 12.

The attachment of clamps 14 to the poles 12 is releasable, so that clamps can be removed, replaced, repositioned, etc. for an unlimited number of times. Similarly, the attachment of the article support formations 16 and/or light fittings 62 to the clamps 14 is releasable, so that the article support formations and/or light fittings can be removed, replaced, repositioned, etc., and the attachment of article engagement formations in the form of a clamps 48, platforms 58 and/or containers 60, to the arms 46, is releasable, so that these articles can also be removed, replaced, etc. The changeability of the system 10 allows its configuration to be changed for an unlimited number of times, with ease.

The invention illustrated holds the advantages of allowing articles to be supported in an unlimited number of support configurations, and allowing the support configurations to be changed quickly and easily, to an unlimited number of different configurations.

The invention illustrated holds the further advantages of low cost and simplicity of construction and operation, and of the versatility of the article engagement formations, which allows articles of a great variety of shapes and sizes to be supported in the system 10.